

Halo phenomena observed during June, 1919—Continued.

Station.	Date.	Colors.†	Degree of brightness.	Clouds.			Station. pressure.	Precipitation.	
				Amount.	Kind.	Direction.		Last previous ended.	First subsequent began.
Tatoosh Island, Wash. (Continued).....	17	Y.....	Dim.....	8 Few.	Cl. St.	sw.			
	17	R. B.....	Dim.....		Cu.				
	17	R. B.....	Dim.....						
	17	Y.....	Dim.....	3	Cl. St.	sw.	Rising.....	7:55 a. m., 14th....	10:50 a. m., 19th.
	18	R. Y. B.....	Bright.....	6	A. St.	sw.			
	18	R. B. W.....	Bright.....	3	Cl. St.	s.			
	18	R. B.....	Dim.....	1	Cl. Cu.	s.			
	18	Y.....	Dim.....						
	18	Y.....	Bright.....	3	Cl. St.	s.	Rising.....	1:55 p. m., 19th....	11:20 a. m., 21st.
	19	O.....	Dim.....	5	A. St.	s.			
	20	R. O. Y. B.....	Bright.....	4	St.	s.			
	20	R. Y. B.....	Dim.....	8	Cl.	s.	Falling.....	1:55 p. m., 19th....	11:20 a. m., 21st.
	20	R. O. Y. G. B. V.....	Bright.....						
	20	Y.....	Dim.....	8	Cl. St.	s.	Falling.....	10:10 a. m., 23d....	4:26 a. m., 25th.
	21	R. O. Y. G. V.....	Bright.....	9	Cl. St.	s.			
	21	R. O. V.....	Bright.....	5	Cl. St.	w.			
	24	R. B.....	Dim.....						
	24	R. B. W.....	Bright.....						
	24	W.....	Dim.....						
	24	W.....	Dim.....						
	24	O.....	Dim.....	3	Cl.	w.	Falling.....	10:10 a. m., 23d....	4:26 a. m., 25th.
	24	R. B. W.....	Dim.....	3	Cl.	w.			
	24	R. B. W.....	Dim.....						
	24	R. O. B.....	Bright.....	9	A. St.	w.	Rising.....	5:25 a. m., 25th....	10:15 a. m., 28th.
	25	R. Y. G. V.....	Bright.....	1	St.	w.			
	25	R. Y. G. V.....	Bright.....	4	Cl.	w.			
York, N. Y.‡.....	26	O.....	Dim.....	2	Cl.	s.	Rising.....	5:25 a. m., 25th....	10:15 a. m., 28th.
	27	R. B.....	Dim.....	5	St. Cu.	s.			
	11	R. Y.....	Brilliant.....	7	A. St.	sw.			
	29	R. O. Y.....	Brilliant.....	10	Cl. St.	nw.	Falling.....	5:25 a. m., 25th....	10:15 a. m., 28th.
				8	Cl. St.	w.	Stationary.....	1:00 p. m., 9th....	4:15 p. m., 16th.
								D. N., a., 27th....	5:00 p. m., 5th.

† Beginning with part nearest sun or moon.

R, red; O, orange, etc.

‡ Taken at Rochester, N. Y.

MONTHLY PUBLICATION OF HALO PHENOMENA TO BE DISCONTINUED.

The foregoing table completes one year's record of halo phenomena, as observed at several well-distributed stations in the United States. In addition to a tabulation of the different forms noted, there have been included such angular measurements as could be made by means of theodolites at the six aerological stations. The purpose of this study, as outlined in the MONTHLY WEATHER REVIEW for July, 1918, pages 309-310, is to obtain a long series of reliable data from which it will be possible to determine the seasonal and latitudinal distribution of the different halo forms and to add to our knowledge concerning angular measurements, relation to types of pressure distribution, precipitation, etc. It was thought that the study should continue at least three, preferably five, years, and it was expected that brief summaries would be published in the MONTHLY WEATHER REVIEW. The continuance of this latter procedure has been found impracticable, however, owing to the large amount of data received for the limited space available in the REVIEW. In the future, therefore, the data will not be published, but they will be tabulated as heretofore at the Central Office and, when a sufficient period of observation has been covered, a general summary will be issued. It is hoped that the enthusiasm heretofore shown by the observers in this work may continue, in order that we may have as complete records as possible of "these attractive and interesting optical phenomena."—W. R. Gregg.

NOTES.

Mr. C. O. Schick, of the Groesbeck, Tex., Aerological Station, reports that on June 10, while traveling in north-east Texas, he observed from one side of the train a "complete and brilliant rainbow," and from the other side "a prismatically colored solar halo of [probably] 22° * * * with brilliant parhelia. * * * The arc of the halo consisted of two sections [of approximately 45° each]. The altitude of the sun was about 10° [90th meridian time]. * * * [As observed a little later] the attendant clouds were six-tenths stratus from the southeast and three-tenths cirro-stratus from the west."

UNUSUAL HALOS AT JUNEAU, ALASKA, JUNE 9, 1919.

By M. B. SUMMERS, Meteorologist.

[Dated Weather Bureau, Juneau, Alaska, June 10, 1919.]

A solar halo of unusual design that was observed at Juneau, Alaska, on the afternoon of June 9, 1919.

The phenomenon was first seen at 12 noon, 135th meridian time, at which hour it consisted solely of the ordinary 22° halo. The additional circles and arcs shown in figure 1 were not observed until 3 p. m., and reached their greatest brilliancy about 3:30 p. m. At that hour all markings in the drawing were fairly well defined except the inner oblique arcs of the anthelion, the left or northern one only being visible. The right, or southern, arc was not observed by the writer, but was seen by a re-

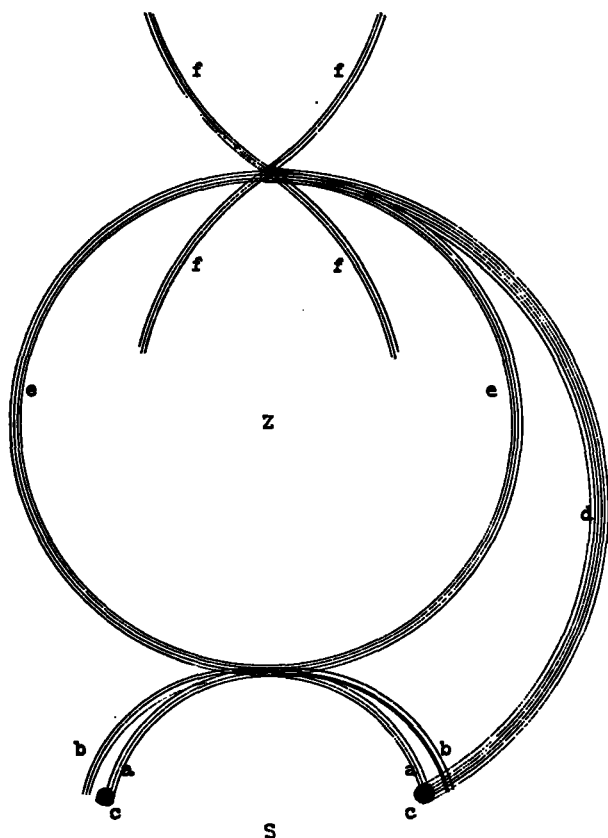


FIG. 1.—Solar halo, Juneau, Alaska, June 9, 1919, 3:30 p. m. *aa*, arc of halo of 22°, red on inside; *bb*, arc of circumscribed halo; *cc*, parhelia, 22°; *d*, parhelic circle; *ee*, apparently what Bravais calls a secondary parhelic circle, approximately 34° radius; *ff*, apparently oblique arcs of the anthelion.

liable observer a few minutes earlier. The only clouds visible were a thin veil of cirro-stratus, which almost disappeared by 4:30 p. m., leaving only a faint trace of the 46° arc. A little later, however, the cloud thickened and the halo was renewed with greater brilliancy than before, but in altered form and design, as shown in figure 2. The clouds in the northern half of the sky thickened rapidly after 5:30 p. m. and by 7:20 p. m. all traces of the halo had disappeared.

The halo of 46° was at times composed of white light and again of the prismatic colors, these being arranged

with the red inside. The same arrangement obtained in the inner 22° halo, but in the circumzenithal arc, tangent to the 46° halo, the colors were reversed. The secondary parhelic circle of approximately 34° radius (fig. 1) was of indifferent color and not so well defined as the smaller and larger circles, but was nevertheless

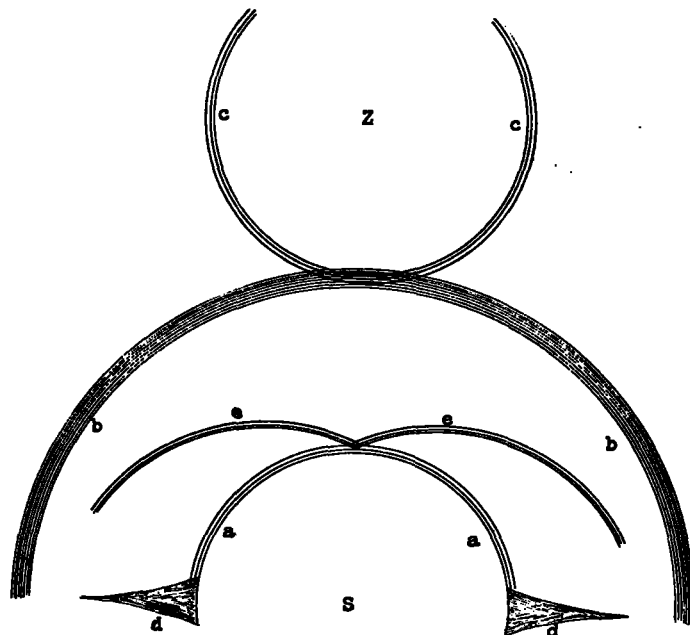


FIG. 2.—Solar halo, Juneau, Alaska, June 9, 1919, 5:30 p. m. *aa*, arc of halo of 22°, red on inside; *bb*, arc of halo of 46°, red on inside; *cc*, circumzenithal arc, red outside; *dd*, brilliant parhelia; *ee*, upper tangent arcs.

plainly visible. The parhelia were unusually prominent and brilliant. As no facilities were at hand for making measurements, the size and angles of the arcs *f* in figure 1 and *e* in figure 2 are only approximate. The arc *d* in figure 1 was measured by Charles E. Davidson, Surveyor General of Alaska, and found to be nearly 46° in radius.

The phenomenon elicited much curiosity and comment on the part of the people of this vicinity. Only a few persons had ever seen a similar display, and many old residents stated that they had never seen the like either in Alaska or the States.

SOLAR AND SKY RADIATION MEASUREMENTS DURING JUNE, 1919.

By HERBERT H. KIMBALL, Professor of Meteorology, in charge.

[Dated: Solar Radiation Investigations Section, Washington, July 30, 1919.]

For a description of instrumental exposures, and an account of the methods of obtaining and reducing the measurements, the reader is referred to the REVIEW for January, 1919, 47:4.

The monthly means and departures from normal in Table 1 show that the radiation measurements averaged below the June normal at all stations. The haze in the lower layers of the atmosphere, referred to in May, was not unusual after the first week in June,

Table 3 shows deficiencies of 3, 5, and 8 per cent in the total radiation for the month at Washington, Madison, and Lincoln, respectively, as compared with the normal amounts for June.

The skylight polarization measurements made at Washington on four days give a mean of 38 per cent, with a maximum of 43 per cent on the 19th. At Madison, measurements made on six days give a mean of 47 per cent, with a maximum of 57 per cent on the 28th. These are unusually low values for June.